III-01.01 Reports and Resources

The designer should consult the following reports and resources as appropriate:

- **Traffic Data.** From the Planning and Programming Division. Information requested from this section includes average daily traffic.

- **Pavement Condition**. The pavement distress and profile report, and maintenance management system project data are available from the Planning and Programming Division.

- **Old Plans for the Project Area.** Located in the records center are copies of completed projects which show what was constructed. These are used to become familiar with what is in place and what improvements will be necessary to bring the new project up to present standards.

  Also, the Surveys & Photogrammetry Section in the Design Division has a SURVEY FOLDER on all proposed regrading projects. This folder contains the following information:

  Existing grading plans
  Railroad plats
  Public land records
  Triangulation Station data
  Bench Mark data
  City Plats
  Utility Plats

- **Linear Soils Survey Report and Surface Thickness Recommendations**. These reports are furnished by the Materials and Research Division which provide soils recommendations and pavement recommendations(thickness of base and surfacing, class of aggregate, percent asphalt etc.), and pavement design life. The pavement design life should be included in the design data information on the plan title sheet.

- **Wetlands Data**– report on the impact to wetlands on the project and what, if any, mitigation must be provided. This is provided by the Engineering and Environmental Section in the Design Division. The consultant may provide this data on the projects they are designing.

- **Cultural Resources Report**. This comes from the Cultural Resource Section of the Design Division. The consultant may provide this report on projects they are designing.

- **Traffic Operations Report** –This report comes from Planning and Programming and provides recommendations with respect to lighting, traffic signals, turning lanes, etc.

- **Survey data.** The project survey data is transmitted to the Records Center, after a survey is completed, by Surveys & Photogrammetry / Design Division or District. The CADD digital data is stored on the network server. See survey transmittal form for file names. The designer must "check out" the transmitted data (hard-copy information such as: survey books, 90-1 data, etc.,) from the Records Center.

- **Safety Review.** Design Traffic Section. For proposed safety improvements, see Section III–14.

- **Right of Way Plats.** Right of Way section in Design

- **Existing Pavement Structure**. EXPRO File.

- **Existing Interstate Grading or Paving Plans.** Design's Plan Files or Card File. **

- **Existing Non-Interstate Paving Plans**.**
  Before 1979- Design's Card File or Records Center in basement of Central Office.
  After 1979- Design's Plan File or Records Center.

- **Existing Non-Interstate Grading Plans**. **
  Before 1979 -Design's Card File or the Records Center.
  After 1979 - The Records Center or sometimes the Designer.

- **Existing bridge information.** Structure Inventory Abbreviated Master Listing.

- **Existing Bridge Plans.** Bridge Division's Plan Files.

- **Existing Aerial Photos.** Aerial Photography Inventory - Photo Lab.
  ** If unable to find at theses locations, check with the respective District.

III–01.02 Coordination During Plan Preparation Process

Generally**,** the following items need to be coordinated by the designer during the preparation of the plans:

III–01.02.1 Environmental

The designer needs to coordinate the clearances if there is a 4(f) or 6(f) situation on the project. See Sections II–05.05.2, 05.06.3,and 05.06.4.

If any wetlands are filled or otherwise altered, the designer needs to coordinate obtaining a 404 permit. See Section II–05.05.6.

If fill is placed in a flood plain, the designer needs to coordinate obtaining a Flood Plain Permit**.** See Section II–05.05.7.

III–01.02.2 Bridge

The designer needs to coordinate with the Bridge Division if there are bridges and/or box culverts on the project, and what, if any, improvements will be made to them.

III–01.02.3 Right-of-way

Generally in the design of a highway project there is a need for right-of-way of some type. This could also be true for a project designed in the district. The **designer** should notify the right-of-way section in the design division, by the milestone date or as soon as it is available, of the R/W needs for the respective project. Typically this would include but would not be limited to the following:

- Permanent R/W
- Temporary construction easement
- Borrow quantity needed.
- Drainage easement
- Relocation assistance if the taking involves an occupied dwelling, business, farm operator or non-profit organization.
- Waste site to dispose of excess material.
- Maintenance storage site.
- Stockpile site.
- Building site.
- Request estimate of R/W cost.
- Check if R/W representative needs to go on the field review.

III–01.02.3.1 Right of Way Width For Urban Projects

New construction or major reconstruction on urban or urban extension systems or in cities with less than 50,000 population will normally require that adequate right of way (R/W) is provided for street hardware, sidewalk and possibly a narrow boulevard. To provide this space will generally require 8 feet from the face of the proposed curb to the R/W. This should be done according to the following procedure:

< The Project Concept Report (PCR) should address the R/W needs from the curb to the R/W line. It should also address any general exceptions to the border width when the dimension is less than 8 feet from face of curb to the R/W line.

< Existing widths less than 8 feet which are not disturbed generally will be allowed to remain if there are no identifiable problems.

< In cases where the border width is reduced to less than 8 feet, the Design, Planning and District Engineers and the representative of the local agency should review the situation and recommend to acquire additional R/W or request an exception to the 8 foot width.

< The 8 foot width may be reduced at certain locations such as right turn lanes. The area must still safely provide space for sidewalk and street hardware (lighting, signing, etc.).

< Approval of the PCR by the Deputy Director for Engineering and the FHWA, where appropriate, will constitute approval for all location exceptions identified in the report. Any deviations to the 8 foot width during design or construction should be coordinated with the Design Engineer.

III–01.02.4 Traffic Control and Guardrail

Generally, the project will involve traffic control items such as signing, pavement marking, traffic signals, and lighting. It may also involve the need for guardrail. These items should be coordinated with the Traffic Section in the Design Division.

III–01.02.5 Utilities

Generally, there are utilities (gas, electric, water, sewer, telephone, etc.) on every project. In many cases they may be in the way of the proposed improvement. The designer needs to coordinate this with the Utilities Engineer in Design to determine the course of action to take. If the utilities have to be relocated or adjusted, the Utilities Engineer will coordinate this with the respective utility.

III–01.02.6 Airport Clearance

Whenever the project is near an airport, the designer needs to coordinate this with the Utilities Engineer in Design who in turn will work with the respective airport authority to obtain an Airport Clearance. See Section III–17.

III–01.02.7 Special Provisions

There are times when the Standard Specifications don't cover the items to be incorporated into the project When this occurs, the designer needs to coordinate with the Engineering Services Section of the Maintenance Division to get the Special Provision written. See Section III–20.

III–01.02.8 Agreements (PE, CE & Maintenance)

When a project involves an urban area, generally they must participate in the cost of preliminary and construction engineering and do maintenance. The Local Government Division will develop this agreement.

For a city under 5000 population the Planning and Programming Division will develop the agreement.

The designer needs to coordinate with them to provide needed information.

III–01.02.9 Railroad Agreements

When the improvements on a project result in having to go on railroad right-of-way, the designer needs to coordinate with the Right-of-Way Section in Design to obtain the necessary document which will permit the Contractor to operate on Railroad right-of-way.

If the proposed work involves a bridge, the designer needs to coordinate with the Bridge Division.

Appendix III-01 Plan Review Checklists

The following checklists are provided in Appendix III-01

- Preliminary Plan Review Checklist
- PS&E Plan Review Checklist
- Final Office Review Checklist
- Plan Design and Development Checklist - General
- Plan Design and Development Checklist - Traffic (Signing, Pavement Marking, Guardrail, Lighting, Traffic Signals)

PRELIMINARY PLAN REVIEW CHECKLIST

Preparation

____ 1. Contact district office to set up a Preliminary Plan Review date, time and location. The preliminary review should be conducted at a time when the plans have progressed sufficiently to allow for proper review of the design features:

____ 2. Send out plan sheets for the preliminary plan review to the meeting participants a minimum of 10 days prior to the scheduled review. Review participants should be identified from the Plan Review Notification and Attendance Chart in Section I-10.05.

____ 3. Set up transportation (state fleet or state plane) and notify participants of travel and review arrangements.

_____ arrange for pickup at airport and call to confirm on the day before the preliminary review.

____ 4. Typical items to be taken to the preliminary review:

_____ preliminary layouts, plan sheets, aerial photos, etc
_____ project concept report and/or environmental documentation
_____ summation of public hearing
_____ disposition of public hearing and decisions
_____ traffic operations report
_____ surface thickness recommendations
_____ linear soil survey recommendations
_____ drainage report
_____ right of way plats
_____ cost estimate
_____ bid opening date and plan completion date
_____ standard specifications and supplemental specifications

Review

____ 5. Standard items to review at the preliminary plan review:

_____ horizontal and vertical alignments
_____ borrow requirements
_____ access requirements

_____ right of way requirements
_____ utilities
_____ traffic control and construction phasing requirements
_____ field laboratory (type and need)
_____ pipe removal requirements
_____ cost estimates (participating and non-participating items)
_____ contract completion dates

Follow-up

____ 6. Prepare report of comments made at preliminary plan review.

____ 7. Prepare responses to comments and review with Design Engineer and Office of Infrastructure Support.

____ 8. Distribute preliminary plan review report and responses to all affected parties.

Note: When the project is being designed by city staff, or by a consultant under a city contract, the above activities are completed by the consultant, or city as appropriate, and coordinated through the NDDOT Local Government Division. When the project is being designed by consultant under NDDOT contract, the above activities are completed by the consultant and coordinated through the NDDOT Design Division, Consultant Agreements Section.

PS&E PLAN REVIEW CHECKLIST

Preparation

_____ 1. Contact district office to set up a PS&E Review date, time and location. The PS&E should be scheduled approximately one month prior to the plan completion date.

_____ 2. Send out plan sheets for the PS&E to the meeting participants a minimum of 10 days prior to the scheduled PS&E. Review participants should be identified from the Plan Review Notification and Attendance Chart in Section I-10.05. If an informal PS&E Review (plans are mailed out only) will take place, request that comments be returned by at least two weeks before the plan completion date

_____ 3. Set up transportation (state fleet or state plane) and notify participants of travel and review arrangements.

_____ Arrange for pickup at airport and call to confirm on the day before the PS&E.

_____ 4. Typical items to be taken to the PS&E:

_____ plan sheets
_____ cost estimate
_____ bid opening date and plan completion date
_____ draft special provisions
_____ standard specifications and supplemental specifications
_____ project concept report and/or environmental documentation
_____ summation of public hearing and disposition of public hearing and decisions
_____ preliminary review information
_____ traffic operations report
_____ surface thickness recommendations
_____ linear soil survey recommendations
_____ drainage report
_____ right of way plats

Review

_____ 5. Standard items to review at the PS&E

_____ title sheets
_____ note sheets
_____ quantity sheets
_____ detail sheets
_____ typical section sheets
_____ plan and profile sheets
_____ work zone traffic control sheets
_____ signing, marking, guardrail, lighting, and signal sheets
_____ structural sheets
_____ cross section sheets
_____ special provisions
_____ cost estimates (participating and non-participating items)
_____ recommendations for contract completion dates

_____ 6. Other items to review at the PS&E, as appropriate:

_____ bid opening date
_____ city cost share (participating and non-participating)
_____ access to residences and businesses during construction
_____ disposition and certification of city utilities and adjustments
_____ temporary surfacing for winter suspension of work satisfactory
_____ all work activities covered by specification, supplemental specification, special provision, or plan note
_____ all work activities are covered by a standard pay item or are incidental by plan note

Follow-up

_____ 7. Prepare report of comments made at PS&E.

_____ 8. Prepare responses to PS&E comments and review with Design Engineer and Office of Infrastructure Support.

_____ 9. Distribute PS&E report and responses to all affected parties.

_____ 10. Make appropriate changes to the plan sheets.

_____ 11. Update cost estimates.

_____ 12. Submit plan sheets and cost estimates to Planning and Programming Division.

Note: When the project is being designed by city staff, or by a consultant under a city contract, the above activities are completed by the consultant, or city as appropriate, and coordinated through the NDDOT Local Government Division. When the project is being

designed by consultant under NDDOT contract, the above activities are completed by the consultant and coordinated through the NDDOT Design Division, Consultant Agreements Section.

FINAL OFFICE REVIEW CHECKLIST

Preparation

_____ 1. Contact review participants to set up a Final Office Plan Review date, time and location. The review should be conducted when the plans are 95% to 100% complete and after the PS&E revisions are made. Review participants should be identified from the Plan Review Notification and Attendance Chart in Section I-10.05.

_____ 2. Typical items to be taken to the final review:

- _____ completed plan sheets
- _____ special provisions
- _____ cost estimate
- _____ project concept report
- _____ disposition of public hearing and decisions
- _____ traffic operations report
- _____ bid opening date and plan completion date
- _____ standard specifications and supplemental specifications

Review

_____ 3. Standard items to review at the final office plan review:

- _____ PS&E comments
- _____ plan development checklist
- _____ project concept report
- _____ cost estimate
- _____ conformance to NDDOT specifications and standards
- _____ quality of construction
- _____ suggested improvements to design features

Follow-up

_____ 4. Prepare project memorandum providing, in detail, any findings of significance. The memorandum is submitted to the Design Engineer and Director - Office of Infrastructure Support when the plans are submitted for signature.

Note: When the project is being designed by city staff, or by a consultant under a city contract, the above activities are completed by the consultant, or city as appropriate, and coordinated through the NDDOT Local Government Division. When the project is being designed by consultant under NDDOT contract, the above activities are completed by the

consultant and coordinated through the NDDOT Design Division, Consultant Agreements Section.

PLAN DESIGN AND DEVELOPMENT CHECKLIST - GENERAL

1. Review Reports and Resources

    a. Review project concept report, summation and disposition of public hearing documents, and/or environmental documents (plan sheets should incorporate all necessary mitigation measures identified)

    b. Review traffic operations report

    c. Review surface thickness and material recommendations

    d. Review linear soil survey recommendations

    e. Review drainage report

    f. Review 90-1 survey and safety review

    g. Gather and review old plans for the proposed project area

    h. Obtain and review survey data

    i. Review milestone for critical activity dates

    j. Schedule preliminary review, PS&E review, and plan completions dates

2. Coordination

    a. Advise other sections, divisions, city, FHWA of changes made in alignment, drive locations, grades, etc.

    b. Review environmental considerations with Design Division - Environmental Section

        i. ACOE Section 404 Permit

            (1) Wetland mitigation

            (2) Large stream crossings

        ii. Review need for erosion control and develop erosion control plan

        iii. Satisfy flood plain requirements

c. Review coordination of signing, marking, signals, lighting, and guardrail with Design Division - Traffic Section

d. Review coordination of private utility relocations and adjustments with Design Division - Traffic Section

   i. Submit preliminary plan and profile sheets and cross section sheets

e. Review coordination of airport clearance with Design Division - Traffic Section

f. Review coordination right of way, easements, encroachments, etc., with Design Division - Right of Way Section

g. Review coordination of bridges and box culverts with Bridge Division

h. Review need for special provisions

   i. Review need of common special provisions

__ ACOE Section 404 Permit
__ Tribal Employment Rights Ordinance (TERO) Requirements
__ Contractor Furnished Scale, Scale Person, and Dump Person
__ 408 Hot Bituminous Pavement - Special
__ 409 Hot Bituminous Pavement - Quality Control/Quality Assurance
__ 409 Hot Bituminous Pavement - Quality Control/Quality Assurance Contractor Mix Design
__ Superpave Volumetric Mix Design
__ Joint Sealing and Sawing - Hot Bituminous Pavement
__ Grinding
__ Dowel Bar Retrofit
__ Tolerance in Surface and Ride Quality for Interstates
__ Concrete Pavement Surface Texture
__ Pumping Equipment
__ Portable Changeable Message Sign
__ Critical Path Method
__ Partnering

   ii. Submit required special provisions to Maintenance and Engineering Services a minimum of 6 weeks before plan completion date

   iii. Submit required TERO special provisions to Maintenance and Engineering Services a minimum of 12 weeks before plan completion date

iv. SP's to be listed on Basis of Estimate of plans (include SP's from other sections and divisions)

i. Review coordination of bench sections and stabilized earth retaining walls with Materials and Research Division

j. Review coordination of Preliminary Engineering and Cost Maintenance Agreements with the Planning and Programming Division or Local Government Division

k. Review coordination of railroad crossings with Planning and Programming Division - Railroad Section

i. Submit preliminary plan and profile sheets and cross section sheets

ii. Determine if crossing are to be abandoned or if the number of tracks be reduced

iii. Determine type of crossing: rubber, wood, or asphalt cement (check with city or district)

iv. Determine type of traffic control: signalized, not signalized

v. Determine clearances

vi. Determine need for pipe crossings, jacked or bored (need standard drawing and railroad request forms for permit)

vii. Include standard drawings for railroad approach and pavement markings

viii. Include standard note 107-100 to identify railroad crossings

ix. Include standard note 107-110 or 107-120 and pay item to require liability insurance

x. Include standard note 200-420 for flagging requirements

xi. Check for correct railroad names

l. City utilities or city projects (participating funds or city funds only)

i. NDDOT to complete design

ii. City to complete design

iii. Include in NDDOT plan sheets, separate plan sheets, tied or not-tied contracts

iv. Review need for city specifications

v. Review bid items, existing, new, and coordination of similar items

vi. Obtain utility certification or disposition of relocations and adjustments

3. Project Files

a. Maintain project files (document meetings, telephone calls, decisions, etc)

4. General Plan Development

a. Develop Geometric Design

i. Horizontal alignments (tangents, curves, spirals, superelevation)

(1) Check design vehicle and truck turning radii

ii. Vertical alignments (grades, crest and sag curves, sight distances, passing zones)

(1) Develop profile grades and PI's (vertical curve lengths calculated from design speed)

(2) Check grade line and topography for hidden intersections or decision sight distance locations

(3) Check grades to fit approaches, driveways, side streets, etc.

(4) Check vertical clearance at bridges

(5) Check grades to fit right of way constraints

iii. Roadway cross section

(1) Review recommended base and pavement structure

(2) Determine profile grade point and cross slopes

(3) Determine lane and shoulder widths

(4) Determine foreslopes

(5) Determine ditch sections and profiles

(6) Determine cut and fill slopes, barn sections and bench sections (bench sections should be reviewed with Materials and Research)

(7) Determine backslopes

b. Develop Intersection Design

i. Develop intersection layout and/or type (Std. Dwg. D-203-6, Type A and B, Radial "T", etc.)

(1) Determine design vehicle and check turning radii

(2) Determine channelization/median requirements

(3) Check lane alignments and skew across intersection

(4) Check sight distances

(5) Check need for traffic islands

(6) Check need for left-turn lanes

(7) Check need for right-turn lanes

(8) Chceck requirements for tapers and storage lengths

(9) Review location for crosswalks and curb ramps

(10) Review signal locations

(11) Review need for parking restrictions

c. Develop Earthwork Design

i. Determine clearing and grubbing

ii. Determine removal of structures

iii. Determine classification of excavation

iv. Determine subcuts

v. Review borrow

(1) Determine borrow or waste requirements

(2) Determine mandatory borrow or mandatory waste requirements

(a) Obtain public interest determination from FHWA for mandatory borrow and excavation sites)

(3) Submit requirements to Design Division - Right of Way Section

vi. Determine need for slope flattening

vii. Determine shrink and swell factors

viii. Balance earthwork and/or determine borrow needs

ix. Compute haul

x. Develop mass diagrams

xi. Review need of erosion control and protection

d. Develop Drainage Design

i. Determine drainage areas, size pipe, and compute quantities for:

(1) Culverts (centerline and approaches)

(2) Storm drains (pipe, inlets, manholes, castings, etc)

(3) Lift stations

e. Develop Right of Way Design

i. Existing permanent right of way

ii. New permanent right of way

iii. Temporary construction easements

iv. Temporary and permanent drainage easements

v. Access control requirements

vi. Intersection sight distance requirements

f. Prepare preliminary and final cost estimates

i. Traffic Section quantities included

ii. Right of Way Section costs included

iii. Bridge Division quantities included

iv. Materials and Research Division quantities included

5. Plan Sheet Development

a. Title Sheet

__ Project numbers (main funding number and secondary funding numbers)
__ PCN number
__ Design data (current and forecast traffic, HS bridge live load, pavement design life, etc.)
__ Project description (county, project number, location, type of work)
__ Governing specifications paragraph
__ Length of project (gross and net miles)
__ North arrow
__ Legal Description (section, township, range)
__ Project data/map (begin and end limits, reference points, stations, equations, bridges, exceptions, county lines, interchanges, and highways)
__ Plan completion date and signature block
__ Mile splits
__ Barrier striping diagram and legend
__ Borrow sites and stockpile sites (may show as separate detail sheet)

b. Table of Content Sheet

__ Sheet description and numbers
__ Sheet numbers included for each contract on multiple contract projects
__ List of Standard Drawings (do not number sheets - include comment to indicate standard drawings are included in back of plans)

c. Scope of Work Sheet

__ Detail showing layout and type of work

d. Plan Note Sheets

__ Review list of standard notes and add appropriate notes
__ Check that all incidental items are included in the notes
__ Check that all pay items listed in notes are included on the quantity sheets

e. Quantity Sheets

__ Check specification and code numbers for matching descriptions
__ Check that totals match plan sheet totals
__ Check that subtotal match totals
__ Show funding splits (participating, non participating, city funds only, alternatives, total)
__ Check to include all quantities from other sections and divisions
__ Check to include all quantities listed in plan notes and special provisions
__ Contract bond, mobilization, railroad insurance, field lab (for tied projects show on the major project only)

f. Basis of Estimate Sheets

__ Grading pay items:
  __ Summary of quantity breakdown (excavation, embankment, etc.)
  __ Water quantity for embankment and dust palliative
  __ Topsoil removal (list depth and areas)
  __ Foundation fill

__ Surfacing pay items:
__ Pavement marking pay items:
__ Erosion control pay items:
  __ Sodding (list areas)
  __ Seeding and temporary cover crop (list areas)
  __ Mulching (list areas)
  __ Hay bales, silt fence (list areas and type)

__ List core locations and surfacing thickness data (blended base projects)
__ List special provisions (number and description)

g. General Detail Sheets

__ Review need of common details
- __ Grading
- __ Slope flattening
- __ Subgrade repair areas
- __ Pipe extensions
- __ Underdrain areas and associated drawings
- __ Flared intersection layouts and approach
- __ Bridge end and railroad crossing
- __ Milling
- __ PCC pavement (dowels, tie bars, joints, reinforcement over pipe, etc)
- __ Ramp layouts
- __ Doweled contraction and expansion joint
- __ Transverse construction joint
- __ Edgedrains and Headwalls
- __ Edgedrain connection to manhole or inlet
- __ Median and turning lane details
- __ Cross-over and ramp connections
- __ Guardrail details
- __ Drainage Details
  - __ Culvert summary sheets (location, type, size, length)
    - __ Hydraulic data for pipe greater than 30 inches (100 yr and design frequency yr)
  - __ Energy dissipater details
  - __ Storm drain summary sheets (location number, location, description, top elev., invert elev., base elev., riser length, casting type, position of incoming lines and inverts) this information may be shown on plan and profile for smaller projects.
  - __ Lift station details
- __ Utility or Trench backfill details
- __ Floating manhole casting
- __ Weigh station
- __ Wetland easements

__ Dimension clarity
__ Cross referencing of details by sheet heading
__ Survey control point data sheet included in plans

h. Typical Sections (Existing and Proposed)

__ Dimensions
__ Location by alignment and stations
__ Profile and survey location
__ Crown rates and superelevation
__ Material classifications

__ HBP: show aggregate and pavement width, thickness, and areas
__ PCC: show aggregate and pavement width, thickness, areas, joints, and tiebars.
__ Edgedrains
__ Pipe installations
__ Geotextile Fabric
__ Excavation limits and/or areas (common, class, subcut, muck)
__ Waste areas (within cross section)
__ Sodding limits
__ existing typical section should show patching with a variable depth (for blended base projects)

i. Plan & Profile Sheets

__ Dimensional clarity
__ North arrow
__ Label businesses
__ Show and label horizontal alignment control points and ties, curve data and superelevation rates, etc. (move survey and alignment information to layout sheets if sheets are too cluttered)
__ Show and label vertical alignment grades, curve data, sight distance data, benchmarks, locations and stations of barrier stripes, etc.
__ Show and dimension existing right of way, proposed right of way, construction easements, drainage easements, section lines, etc.
__ Show and label radius returns
  __ Label length of radius
  __ Label station and offset or northing/easting of radius points
  __ Check design vehicle truck turning movements
__ Show and label driveway widths, lengths, and locations
__ Show and label curb ramps

__ Earthwork
  __ Label mile split quantities
  __ Label locations and quantities of borrow entered into mass
  __ Label locations and quantities of hauled materials from side roads etc. entered into mass
  __ Label average haul
  __ Label locations and quantities of special excavation and subcut
  __ Label locations and quantities of clearing and grubbing and topsoil removal
  __ Label locations and quantities of topsoil borrow
  __ Label locations and quantities for approaches, drives, etc.
  __ Show and label bypass locations, horizontal and vertical alignments, and quantities

__ Show and Label all ditch grades and ditch blocks
__ Show and label Riprap foundation fill, erosion control locations, retaining walls etc.
__ Label and show erosion control (may include in basis of estimate or as detail sheet)
__ Culverts
__ Label removal and/or plug locations
__ Storm drains (inlets and manholes)
__ Check number of inlets or manholes to match summary and quantity sheets
__ Check type of inlet and casting
__ Check manhole size to accommodate storm drain line sizes
__ Check elevations
__ Check riser lengths to elevations shown
__ Check offset locations (offset distance to center of riser)
__ Check length of storm drain lines
__ Check if city or district want insulation on inlets?
__ Check if city or district want a minimum depth for inlets?
__ Show and label direction of drainage flow (ditches, culverts, storm drain)
__ Check existing underground utilities for details (elevation and location)
__ Cross reference detail sheets that apply
__ List pay item quantities
__ Make sure all changes are corrected on related sheets and quantities

j. General Layout and Alignment Sheets

__ If the plan and profile become cluttered, it may be necessary to provide separate sheets for the alignment data, removal data, etc.
__ Dimension clarity

k. Paving Detail Sheets

__ Dimension clarity
__ Show survey and office location designation
__ Show and label joint spacing, locations, type, tie bars, seal, etc.
__ Show and label pavement reinforcement over pipe
__ Show and label driveways, sidewalks, curb ramps, median paving etc.
__ List pay item quantities by page
__ This information may be on plan and profile

l. Work Zone Traffic Control Sheets

__ Develop work zone traffic control note (identify construction phasing, restrictions, maintenance of access, applicable standard drawings etc.)
__ Develop work zone traffic control details and layouts (construction phasing and/or special considerations, show and label signing, devices, markings etc.)
__ Develop "Traffic Control Devices List"
__ Review need for special signs
__ Review need for traffic control supervisor
__ Review work zone speed limits speed limits guidelines
__ Review edge drop-off guidelines and notes
__ Review warrants for portable changeable message signs
__ Check if detours are required
__ Check if temporary bypasses are required
__ Give Traffic Section a copy of plans to review the traffic control

m. Lighting and Signal Sheets

__ Advise Design Division - Traffic Section of changes and/or revisions
__ Coordinate data for typical section, horizontal and vertical alignment
__ Obtain estimated quantities, spec and code
__ See Also: Plan Design and Development Checklist - Traffic Control Design

n. Signing and Markings Sheets

__ Advise Design Division - Traffic Section of changes and/or revisions
__ Coordinate data for typical section, horizontal and vertical alignment
__ Obtain estimated quantities, spec and code
__ See Also: Plan Design and Development Checklist - Traffic Control Design

o. Guardrail Sheets

__ Advise Design Division - Traffic Section of changes and/or revisions
__ Coordinate data for typical section, horizontal and vertical alignment
__ Obtain estimated quantities, spec and code
__ See Also: Plan Design and Development Checklist - Traffic Control Design

p. Bridge Sheets

__ Advise Bridge Division of changes and/or revisions
__ Coordinate data for typical section, horizontal and vertical alignment
__ Obtain estimated quantities, spec and code

q. Pit Plat Sheets

__ Insert pit plat sheets form Materials and Research
  __ Included in plans
  __ Not required

r. Haul Road Restriction Sheets

__ Insert haul road restrictions sheets
  __ Included in plans
  __ Not required

s. Soils Profile and Cross Sections

__ Insert soil profile and/or cross section sheets form Materials and Research
  __ Included in plans
  __ Not required

t. Cross Sections

__ If earthwork sheets are not included, add cut and fill quantities to sections
  __ Included in plans (include in plans if 25 sheets or less)
  __ Not included in plans (include plan note 110-014)
__ Run cross sections with marked points for future reports generated by district
__ Show and label inlets and manholes
  __ Cross reference to plan and profile
__ Check slopes and grade line to match existing terrain and within right of way limits

u. Standard Drawings

__ Review list of standard drawings and add appropriate drawings
__ Standard Drawings to be listed on Table of Contents of plans (include standards from other Sections and Divisions.)
__ Pull required standard drawings and include in back of original plans only.

PLAN DESIGN AND DEVELOPMENT CHECKLIST - TRAFFIC CONTROL DESIGN (SIGNING, PAVEMENT MARKING, GUARDRAIL, LIGHTING, TRAFFIC SIGNALS)

A. Signing

1. Check safety review for recommendations for signs with A-frames and other substandard signs.

Comment. _____

2. Compare Sign Locations and Layout information with Sign Summary Sheet.

Comment. _____

3. Check Junction signing for placement and distance from intersections.

Comment. _____

a. Stop Conditions, Route Turn Markers across the intersections.

Comment. _____

b. Check lighting plans to see if signs can be placed on light standards.

Comment. _____

c. Distance and Destination sign legends to be checked with District Maps from Operations Section in Planning Division.

Comment. _____

4. Sign Supports.

a. Check lengths on summary sheets.

Comment. _____

b. Check breakaway types - round pipe

1. Type A Single Post Signs

Comment. _____

2. Type B Two Post Signs with post spacing less than 8 feet.

Comment. _____

3. Type C Two Post or More Signs with post spacing 8 feet or more.

Comment. _____

4. Check fuse joint requirements.

Comment. _____

c. Multi-Direction Breakaway Bases - Round Pipe to be used at ramp terminals where post can be struck in any direction.

Comment. _____

d. Sign Areas

1. Primary and Secondary Signs.

a. Type 2 - Reflective Sheeting. All sign backgrounds except as listed in b.

Comment. _____

b. Type 3a - Reflective Sheeting. Stop Signs, Yield Signs, Do Not Enter Signs, Wrong Way Signs, All Yellow Warning Signs, Legends of Green, Blue, and Brown Background Signs.

Comment. _____

2. Interstate Highway Signs.

a. Check to see if signs have notes on layouts requiring type 3a retroreflective sheeting for signs.

Comment. _____

5. Check if standards that are required have been provided.

Comment. _____

6. Check if special notes for this project are provided.

Comment. _____

7. Check if Standard Notes are provided:

754-050	Sign Supports
754-210	Reset Sign Panels (Perforated Tube to Pipe)
754-220	Removal of Steel Pipe Supports
754-230	Reset Sign Panels (On New Supports)
754-240	New Exit Number Sign (Furnishing Angles and Hardware)
754-250	Reset Exit Number Sign Panel (Move Exit Number to Edge of Main Sign)
754-260	Remove Overhead Sign Structure
754-280	Remove Cantilever Overhead Sign Structure
754-280	Reset Overhead Sign Structure
754-300	Remove Overhead Sign on Bridge Structure
754-310	Overhead Sign Structure on Bridge (Requirements for Anchorage to Bridge
754-320	Inspection Walk
754-330	Overhead Sign Structure on Bridge (Requires the Contractor to Remove the Overhead Structure and Modify as Required and Reinstall)
754-340	Reset Mile Posts
754-350	Delineators.

Comment. _____

8. Check if cost estimate items and cost are correct.

Comment. _____

9. Check sign design layout sheets for station color and area.

Comment. _____

10. Check special assembly layouts for sign sizes and correct station.

Comment. _____

B. Pavement Markings

1. Check Pavement Marking Material Selection Chart. The materials shall meet these requirements.

Comment. _____

2. The center line for two-lane two-way roadways shall be yellow.

Comment. _____

3. The left edge line for divided highways shall be yellow.

Comment. _____

4. Layouts shall have width and color of line shown.

Comment. _____

5. The pay items shall be listed on plan layouts showing the material, color, type of line and quantity. Each width of line shall be totaled. Check totals. Compare line widths and color with what is shown on layouts.

Comment. _____

6. Check if Standards have been provided.

Comment. _____

7. Check if special notes for this project are provided.

Comment. _____

8. Check if items and costs are provided.

Comment. _____

9. Check if Standard Notes are provided:

762-020 Preformed Patterned Pavement Marking Film (This Requires 440 film for transverse lines)
762-025 Preformed Patterned Pavement Marking - Lines and Messages (grooved)
762-100 Requires white pavement marking paint to be tested.

762-101 Requires yellow pavement marking paint to be tested.
762-102 Requires white and yellow pavement marking paint to be tested.
762-150 Plastic Pavement Marking (Requires Pavement Markings to be Rolled into Hot Asphalt).
762-151 Preformed Patterned Pavement Marking. (Requires Pavement Markings to be Rolled into Hot Asphalt).
762-300 Pavement Marking Removal.

Comment. _____

10. Check if special notes are provided.

Comment. _____

C Guardrails

1. Check safety reviews to see if guardrail is proposed.

Comment. _____

2. Review concept report for guardrail requirements.

Comment. _____

3. Determine if guardrail embankment is to be placed with grading or a separate item.

Comment. _____

4. Check to determine if special notes are required.

Comment. _____

5. Check if Standards have been provided.

Comment. _____

6. Check if items and costs are provided.

Comment. _____

7. Check if standard notes are provided:

764-100 Adjust Guardrail

764-150 Guardrail Posts
764-200 W-Beam Guardrail and Three Cable Guardrail Wood Post
764-300 Embankment for Guardrail Installation
764-301 Embankment for Guardrail Installation
764-305 Embankment for Guardrail and Pipe Culvert or Cattle Pass Extensions
764-460 Reset W-Beam Guardrail
764-465 Reset W-Beam Guardrail
764-650 3' 1.5" Post Spacing at Piers
764-670 12'- 6" Post Spacing
764-800 Remove End Treatment and Transition
764-810 Remove Box Beam Guardrail
764-815 Remove 3-Cable Guardrail and Posts
764-820 Remove 4-Cable Guardrail and Posts
764-850 Remove W- Beam Guardrail and Posts.

Comment. _____

D Lighting

1. Interim Lighting.

   a. Check Layout to determine if permanent lighting will interfere with interim lighting.

   Comment. _____

   b. Check to determine if pedestrians can negotiate around interim lighting and construction area.

   Comment. _____

   c. Check to see that underground and overhead utilities do not interfere with placement of poles, anchors, and wires.

   Comment. _____

   d. Check that permanent signal will fit while interims are operating.

   Comment. _____

   e. Check summary of quantities conduit and cable runs and notes.

      (1) Items to be bid as each.

Comment. _____

2. Permanent Lighting.

   a. Check Layout to determine if permanent lighting will fit interim lighting.

   Comment. _____

   b. Check to determine if pedestrians will be able to negotiate around light poles.

   Comment. _____

   c. Check to see if break-away bases are required.

   Comment. _____

   d. Check location if in the way of construction.

   Comment. _____

   e. Check to see that underground and overhead utilities do not interfere with placement of poles and mast arms.

   Comment. _____

   f. Check if festoon circuit is required.

   Comment. _____

   g. Check that pull box locations are shown on the plan layout.

   Comment. _____

   h. Check if stations of layout items agree with quantity calculations and quantity sheet.

   Comment. _____

   i. Check feed point location.

   Comment. _____

   j. Check summary of quantities conduit and cable runs.

Comment. _____

k. Check if special feed point requirements are needed and a layout.

Comment. _____

l. Check if note is provided when removed equipment is not to become property of the state.

Comment. _____

m. Check if all side street lighting has power provided.

Comment. _____

n. Check if Lighting Standards have been provided.

Comment. _____

o. Check if items and costs are provided.

Comment. _____

3. Check to determine if special notes are required.

Comment. _____

4. Check if standard notes are provided

770-001	Overhead Line Clearances
770-024	Light Standards (Davit Type Mast Arm, Anchor Base)
770-025	Light Standards (Davit Type Mast Arm, Anchor base where Break-away bases are not called for)
770-026	Break-away Light Standards (Rural Section)
770-027	Break-away Light Standards (Davit Type Mast Arm for both Rural And Urban Roadways)
770-028	Breakaway Light Standard (Davit Type Mast Arm, Break-away Base, 42' Shaft)
770-029	Light Standard Extension
770-030	Architectural Light Standards
770-032	Additional Conduit
770-034	Sodium Vapor Luminaire (mounted on Existing Light Standards)

770-035 Architectural sodium Luminaire
770-037 Underpass Lighting Unit (Wall Mounted)
770-038 Existing Lights. 770-039 Existing Mercury Luminaires
770-041 Structural Plan Layouts
770-043 Remove Street Light Luminaires
770-100 Temporary Light System
770-101 Item Lighting System
770-150 Feed Point
770-625 Photo Cell
770-645 Multiple Underground Cable
770-650 Polyethylene Conduit, Pre-wired
770-660 Light Standard foundations
770-700 Luminaires
770-710 H. P. sodium Vapor Luminaires
770-900 Relocate Light Standard
770-925 Remove Light Standard.

Comment. _____

5. Check if Utility Company Feed Point Letter is Prepared.

Comment. _____

E Traffic Signals

1. Interim Traffic Signal

   a. Check Layout to determine if permanent signals are behind interim signals.

   Comment. _____

   b. Check to determine if pedestrian signals are needed. If replacing in-place signals that are in the way of construction, and pedestrian signals are in place, pedestrian signals are needed in the interim.

   Comment. _____

   c. Check to see that underground and overhead utilities do not interfere with placement of poles, anchors and placement of span wires.

   Comment. _____

   d. Check that poles and anchors do not interfere with pedestrians.

Comment. _____

e. Check so that permanent signals will fit while interims are operating.

Comment. _____

f. Check note on coiling enough cable for relocation of signal heads during different phases.

Comment. _____

g. Check if interim item is placed on the plan layout.

Comment. _____

h. Check if interim signal heads have 2 signal heads in each direction and have a dimension of at least 8 feet between.

Comment. _____

i. Check cable runs with signal head numbers.

Comment. _____

j. Check to see if signal head and traffic volume layouts are shown.

Comment. _____

k. Check Timing, phasing, cam breakout, notes and flashing requirements.

Comment. _____

l. Check summary of quantities conduit and cable runs and notes.

1) Items to be bid as each.
2) State Furnished items.
3) These items to be wood pole mounted.

Comment. _____

m. Check if interim signals need to be coordinated.

Comment. _____

2. Permanent Traffic Signals.

   a. Check Layout to determine if permanent signals are behind interim signals.

   Comment. _____

   b. Check if near side signals are required.

   Comment. _____

   c. Check if the signal standards are within the clear zone.

   Comment. _____

   d. Check to determine if pedestrian signals are needed.

   Comment. _____

   e. Check location so that signal is not in the way of construction and that pedestrian signals are in place near crosswalk.

   Comment. _____

   f. Check that lane width and all other street dimensions are shown.

   Comment. _____

   g. Check to see that underground and overhead utilities do not interfere with placement of poles and mast arms.

   Comment. _____

   h. Check the need for pedestrian actuation push buttons other than on signal poles.

   Comment. _____

   i. Check if signals have 2 signal heads for through movement in each direction and have a dimension of at least 8 feet between.

   Comment. _____

j. Check that signal and pedestrian heads are positioned so they match standard drawings.

Comment. _____

k. Check if pedestrian push button sign location number and direction it's facing are shown on plan layout.

Comment. _____

l. Check that pull box locations are shown on the plan layout.

Comment. _____

m. Check if emergency vehicle preemption location and number are shown on plans.

Comment. _____

n. Check cable runs with signal head numbers and color coding.

Comment. _____

o. Check that combination signal and light standards have lighting conductors only entering the pole base.

Comment. _____

p. Check to see if signal head and traffic volume layouts are shown.

Comment. _____

q. Check if stations of layout items agree with quantity calculations and quantity sheet.

Comment. _____

r. Check timing, phasing, cam breakout, notes and flashing requirements.

Comment. _____

s. Check if emergency preemption is used and that phasing is shown.

Comment. _____

t. If existing signals are being removed, show layout and list removed items and quantity.

Comment. _____

u. Check if note is provided when removed equipment is not to become property of the state.

Comment. _____

v. Check traffic signal cross section to be sure the signal location and stationing agree with other layouts. Check if street name signs are the same as shown on signing plans.

Comment. _____

w. Check controller location and direction of door opening.

Comment. _____

x. Check summary of quantities conduit and cable runs and notes.

1) Internal wiring note.
2) Emergency vehicle indicator light conductor.
3) Emergency vehicle detector cable.
4) Indicating internal wire quantities.

Comment. _____

y. Check if signal heads on signal poles at cross section are located correctly.

Comment. _____

z. Check if signs for signal head requirements are same as signing plan layouts.

Comment. _____

aa. Check if signal progression is required in plans and check progression layout for content, etc.

Comment. _____

bb. Check if Emergency Vehicle Preemption needs advance detection.

Comment. _____

cc. Check to see if interconnect conductor to be placed between intersection. Interconnect shall be in separate conduit. Pull boxes shall be placed every 500 feet maximum.

Comment. _____

dd. Check to see if railroad signal interconnect is provided or necessary.

Comment. _____

ee. Detector loops shall be numbered, showing the number of amplifiers, number of turns, sizes, type of loop, number of preformed loops, and number of micro-loops both double and single prop sets.

Comment. _____

ff. Check if speed monitoring is required.

Comment. _____

3. Check if special feed point requirements and layout are needed.

Comment. _____

4. Check if Standard Notes are provided.

Comment. _____

5. Check if Standards have been provided.

Comment. _____

6. Check if items and costs are provided.

Comment. _____

7. Check to determine if special notes are required.

Comment. _____

8. Check if standard notes are provided:

772-006 Signal Testing and Initial Operation
772-007 Contractor Coordination
772-008 Existing Plans
772-009 Padlocks
772-012 Additional Conduit
772-015 Pretime Controller
772-019 Controller Protection
772-021 Slipfitter
772-022 Combination light and Signal Standard
772-100 Paint.
772-210 Pull Box Insulation Board
772-220 Calling Loops
772-230 Micro Probe
772-240 Interconnect Cable
772-250 Pretimed Controller (Interconnected System)
772-300 Controller Expansion
772-320 Coordination Equipment
772-330 Interim Traffic Signal
772-340 Communications Module
772-349 Controller Monitoring Unit and/or Communications Module
772-350 Controller Monitoring Unit and/or Communications Module
772-351 Communications Interface
772-360 Electro-Mechanical Changeable Message Sign
772-401 Relocate Pedestrian Signal Head
772-402 Relocate Traffic Signal Head
772-403 Relocate Signal Standard
772-500 Flashing Beacon and Sequencing Arrow Panel.

Comment. _____

9. Check if Utility Company Feed Point Letter is prepared.

Comment. _____